WHAT IS CLAIMED IS:

1. A motor comprising:

a cylindrical magnet of which outer circumferential surface is divided into portions in a circumferential direction, which are alternately magnetized to different poles;

first outer magnetic pole portions which are formed by gapping part of a cylinder from a distal end in an axial direction of said motor and oppose the outer circumferential surface of said magnet;

second outer magnetic pole portions which are formed by gapping part of a cylinder from a distal end in an axial direction of said motor and oppose the outer circumferential surface of said magnet;

first inner magnetic pole portions opposing an inner circumferential surface of said magnet;

second inner magnetic pole portions opposing the inner circumferential surface of said magnet;

a first coil which is located at a position between said first outer magnetic pole portions and said first inner magnetic pole portions in the axial direction of said magnet and excites said first outer magnetic pole portions;

a second coil which is located at a position between said second outer magnetic pole portions and said second inner magnetic pole portions on an opposite side to said first coil in the axial direction of said

magnet and excites said second outer magnetic pole portions; and

an annular member which is in contact with the inner circumferential surface of said magnet and fits with at least said first inner magnetic pole portions or second inner magnetic pole portions.

2. A motor according to claim 1, wherein said annular member is positioned between the inner circumferential surface of said magnet and outer circumferential surfaces of said inner magnetic pole portions.

3. A motor according to claim 2, wherein said annular member slidably moves on the inner circumferential surface of said magnet.

4. A motor according to claim 2, wherein said annular member slidably moves on outer circumferential surfaces of said inner magnetic pole portions.

5. A motor according to claim 1, wherein said annular member has a plurality of projections on an outside portion in a radial direction, and the projections fit between said inner magnetic pole portions.

6. A motor according to claim 1, wherein said annular member has a plurality of projections on an outside portion in a radial direction, and said magnet slides on the projections.

7. A motor according to claim 1, wherein said magnet has a projection on an inner surface, which is positioned between said first inner magnetic pole portions and said inner magnetic pole portions.

8. A motor comprising:

a cylindrical magnet of which outer circumferential surface is divided into portions in a circumferential direction, which are alternately magnetized to different poles;

first outer magnetic pole portions which are formed by gapping part of a cylinder from a distal end in an axial direction of said motor and oppose the outer circumferential surface of said magnet;

second outer magnetic pole portions which are formed by gapping part of a cylinder from a distal end in an axial direction of said motor and oppose the outer circumferential surface of said magnet;

first inner magnetic pole portions opposing an inner circumferential surface of said magnet;

second inner magnetic pole portions opposing the inner circumferential surface of said magnet;

a first coil which is located at a position between said first outer magnetic pole portions and said first inner magnetic pole portions in the axial direction of said magnet and excites said first outer magnetic pole portions;

a second coil which is located at a position between said second outer magnetic pole portions and said second inner magnetic pole portions on an opposite side to said first coil in the axial direction of said magnet and excites said second outer magnetic pole portions;

a first annular member which is in contact with the inner circumferential surface of said magnet and fits with said first inner magnetic pole portions; and

a second annular member which is in contact with the inner circumferential surface of said magnet and fits with said second inner magnetic pole portions.

9. A motor according to claim 8, wherein said magnet has a projection on an inner surface, which is positioned between said first annular member and said second annular member.

10. A motor comprising:

a cylindrical magnet of which outer circumferential surface is divided into portions in a circumferential direction, which are alternately

magnetized to different poles;

first outer magnetic pole portions which are formed by gapping part of a cylinder from a distal end in an axial direction of said motor and oppose the outer circumferential surface of said magnet;

second outer magnetic pole portions which are formed by gapping part of a cylinder from a distal end in an axial direction of said motor and oppose the outer circumferential surface of said magnet;

first inner magnetic pole portions opposing an inner circumferential surface of said magnet;

second inner magnetic pole portions opposing the inner circumferential surface of said magnet;

a first coil which is located at a position between said first outer magnetic pole portions and said first inner magnetic pole portions in the axial direction of said magnet and excites said first outer magnetic pole portions;

a second coil which is located at a position between said second outer magnetic pole portions and said second inner magnetic pole portions on an opposite side to said first coil in the axial direction of said magnet and excites said second outer magnetic pole portions; and

an annular member which is in contact with the outer circumferential surface of said magnet and fits with at least said first outer magnetic pole portions

or second outer magnetic pole portions.

11. A motor according to claim 10, wherein said annular member is positioned between the outer circumferential surface of said magnet and inner circumferential surfaces of said outer magnetic pole portions.

12. A motor according to claim 11, wherein said annular member slidably moves on the outer circumferential surface of said magnet.

13. A motor according to claim 11, wherein said annular member slidably moves on inner circumferential surfaces of said outer magnetic pole portions.

14. A motor comprising:

a cylindrical magnet whose outer circumferential surface is divided into portions in a circumferential direction, which are alternately magnetized to different poles;

first outer magnetic pole portions which are formed by gapping part of a cylinder from a distal end in an axial direction of said motor and oppose the outer circumferential surface of said magnet;

second outer magnetic pole portions which are formed by gapping part of a cylinder from a distal end

in an axial direction of said motor and oppose the outer circumferential surface of said magnet;

first inner magnetic pole portions opposing an inner circumferential surface of said magnet;

second inner magnetic pole portions opposing the inner circumferential surface of said magnet;

a first coil which is located at a position between said first outer magnetic pole portions and said first inner magnetic pole portions in the axial direction of said magnet and excites said first outer magnetic pole portions;

a second coil which is located at a position between said second outer magnetic pole portions and said second inner magnetic pole portions on an opposite side to said first coil in the axial direction of said magnet and excites said second outer magnetic pole portions; and

an annular coupling member which is in contact with the outer circumferential surface of said magnet and fits with and fixes said first and second outer magnetic pole portions.

15. A motor according to claim 14, wherein said annular coupling member comprises a plurality of projections on an inside portion in a radial direction, which fit between the first and second outer magnetic pole portions.

16. A motor according to claim 15, wherein the projections comprise regulating portions for regulating movement of said magnet in an axial direction of said motor.

17. A motor according to claim 15, wherein the projections regulate positions of said first and second outer magnetic pole portions in the axial direction.

18. A motor according to claim 15, wherein the projections regulate phases of said first and second outer magnetic pole portions in the circumferential direction.

19. A motor comprising:

a cylindrical magnet of which outer circumferential surface is divided into portions in a circumferential direction, which are alternately magnetized to different poles;

first outer magnetic pole portions which are formed by gapping part of a cylinder from a distal end in an axial direction of said motor and oppose the outer circumferential surface of said magnet;

second outer magnetic pole portions which are formed by gapping part of a cylinder from a distal end in an axial direction of said motor and oppose the outer circumferential surface of said magnet;

first inner magnetic pole portions opposing an inner circumferential surface of said magnet;

second inner magnetic pole portions opposing the inner circumferential surface of said magnet;

a first coil which is located at a position between said first outer magnetic pole portions and said first inner magnetic pole portions in the axial direction of said magnet and excites said first outer magnetic pole portions; and

a second coil which is located at a position between said second outer magnetic pole portions and said second inner magnetic pole portions on an opposite side to said first coil in the axial direction of said magnet and excites said second outer magnetic pole portions,

wherein movement of said magnet in the axial direction of said motor is regulated on an inner surface by said first and second inner magnetic pole portions.

20. An optical apparatus comprising:

a cylindrical magnet of which an outer circumferential surface is divided into portions in a circumferential direction, which are alternately magnetized to different poles;

first outer magnetic pole portions which are formed by gapping part of a cylinder from a distal end

in an axial direction of said motor and oppose the outer circumferential surface of said magnet;

second outer magnetic pole portions which are formed by gapping part of a cylinder from a distal end in an axial direction of said motor and oppose the outer circumferential surface of said magnet;

first inner magnetic pole portions opposing an inner circumferential surface of said magnet;

second inner magnetic pole portions opposing the inner circumferential surface of said magnet;

a first coil which is located at a position between said first outer magnetic pole portions and said first inner magnetic pole portions in the axial direction of said magnet and excites said first outer magnetic pole portions;

a second coil which is located at a position between said second outer magnetic pole portions and said second inner magnetic pole portions on an opposite side to said first coil in the axial direction of said magnet and excites said second outer magnetic pole portions;

an annular member which is in contact with the inner circumferential surface of said magnet and fits with at least one of said first inner magnetic pole portions and said second inner magnetic pole portions; and

an aperture blade which is driven by said magnet

to adjust an aperture amount.

21. An optical apparatus comprising:

a cylindrical magnet of which an outer circumferential surface is divided into portions in a circumferential direction, which are alternately magnetized to different poles;

first outer magnetic pole portions which are formed by gapping part of a cylinder from a distal end in an axial direction of said motor and oppose the outer circumferential surface of said magnet;

second outer magnetic pole portions which are formed by gapping part of a cylinder from a distal end in an axial direction of said motor and oppose the outer circumferential surface of said magnet;

first inner magnetic pole portions opposing an inner circumferential surface of said magnet;

second inner magnetic pole portions opposing the inner circumferential surface of said magnet;

a first coil which is located at a position between said first outer magnetic pole portions and said first inner magnetic pole portions in the axial direction of said magnet and excites said first outer magnetic pole portions;

a second coil which is located at a position between said second outer magnetic pole portions and said second inner magnetic pole portions on an opposite

side to said first coil in the axial direction of said magnet and excites said second outer magnetic pole portions;

an annular member which is in contact with the inner circumferential surface of said magnet and fits with at least one of said first inner magnetic pole portions and said second inner magnetic pole portions; and

a lens driving member which is driven by said magnet to move in an optical axis direction.

22. An optical apparatus comprising:

a cylindrical magnet of which an outer circumferential surface is divided into portions in a circumferential direction, which are alternately magnetized to different poles;

first outer magnetic pole portions which are formed by gapping part of a cylinder from a distal end in an axial direction of said motor and oppose the outer circumferential surface of said magnet;

second outer magnetic pole portions which are formed by gapping part of a cylinder from a distal end in an axial direction of said motor and oppose the outer circumferential surface of said magnet;

first inner magnetic pole portions opposing an inner circumferential surface of said magnet;

second inner magnetic pole portions opposing the

inner circumferential surface of said magnet;

a first coil which is located at a position between said first outer magnetic pole portions and said first inner magnetic pole portions in the axial direction of said magnet and excites said first outer magnetic pole portions;

a second coil which is located at a position between said second outer magnetic pole portions and said second inner magnetic pole portions on an opposite side to said first coil in the axial direction of said magnet and excites said second outer magnetic pole portions;

an annular member which is in contact with the inner circumferential surface of said magnet and fits with at least one of said first outer magnetic pole portions and said second outer magnetic pole portions; and

an aperture blade which is driven by said magnet to adjust an aperture amount.

23. An optical apparatus comprising:

a cylindrical magnet of which an outer circumferential surface is divided into portions in a circumferential direction, which are alternately magnetized to different poles;

first outer magnetic pole portions which are formed by gapping part of a cylinder from a distal end

in an axial direction of said motor and oppose the outer circumferential surface of said magnet;

second outer magnetic pole portions which are formed by gapping part of a cylinder from a distal end in an axial direction of said motor and oppose the outer circumferential surface of said magnet;

first inner magnetic pole portions opposing an inner circumferential surface of said magnet;

second inner magnetic pole portions opposing the inner circumferential surface of said magnet;

a first coil which is located at a position between said first outer magnetic pole portions and said first inner magnetic pole portions in the axial direction of said magnet and excites said first outer magnetic pole portions;

a second coil which is located at a position between said second outer magnetic pole portions and said second inner magnetic pole portions on an opposite side to said first coil in the axial direction of said magnet and excites said second outer magnetic pole portions;

an annular member which is in contact with the outer circumferential surface of said magnet and fits with at least one of said first outer magnetic pole portions and said second outer magnetic pole portions; and

a lens driving member which is driven by said

magnet to move in an optical axis direction.

24. An opitcal apparatus comprising:

a cylindrical magnet of which an outer circumferential surface is divided into portions in a circumferential direction, which are alternately magnetized to different poles;

outer magnetic pole portions which are formed by gapping part of a cylinder from a distal end in an axial direction of said motor and oppose the outer circumferential surface of said magnet;

inner magnetic pole portions opposing an inner circumferential surface of said magnet;

a coil which is located at a position between said outer magnetic pole portions and said inner magnetic pole portions in the axial direction of said magnet and excites said outer magnetic pole portions;

an annular member which is in contact with the inner circumferential surface of said magnet and fits with said inner magnetic pole portions or said outer magnetic pole portions and has a hollow portion as an optical axis of a lens;

an aperture blade which is driven by said magnet to adjust an aperture amount.

25. An optical apparatus comprising:

a cylindrical magnet of which an outer

circumferential surface is divided into portions in a circumferential direction, which are alternately magnetized to different poles;

outer magnetic pole portions which are formed by gapping part of a cylinder from a distal end in an axial direction of said motor and oppose the outer circumferential surface of said magnet;

inner magnetic pole portions opposing an inner circumferential surface of said magnet;

a coil which is located at a position between said outer magnetic pole portions and said inner magnetic pole portions in the axial direction of said magnet and excites said outer magnetic pole portion;

an annular member which is in contact with the inner circumferential surface of said magnet and fits with said inner magnetic pole portions or said outer magnetic pole portions;

a lens driving member which is driven by said magnet to move in an optical axis direction in said hollow portion of said annular member.